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ABSTRACT

This document reports on a conference about the use of existing resources to teach nature education to urban children. The conference was organized around the question of how to encourage more positive use of parklands for outdoor nature education. The conference was held in New York City's Central Park and over 80 leaders representing city schools and nature resources participated. The report includes the keynote addresses by New York City's Commissioner of Environmental Protection, Albert Appleton, who chose "cities as part of our natural environment" as his theme, and renowned naturalist, Roger Tory Peterson, who in discussing the role of nature study in environmental education, described how his lifetime devotion to the study and interpretation of nature originated in a fascination with birds fostered by his seventh grade teacher in Jamestown, New York. The document also presents a paper by educator Maritza MacDonald who spoke about different perspectives on urban nature education and nature education resources. Small group discussions between conference participants resulted in the following recommendations: (1) to improve teacher training with respect to nature education; (2) to develop school-community partnerships; (3) to encourage families to use parks; and (4) to acknowledge the importance of camping, outdoor experiences, and individualized curriculum in nature education. A summary of the conference, a list of the names and addresses of participants, and a brief list of urban nature education resources are included. (LP)

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Nature Education in the Urban Environment

Roger Tory Peterson Institute
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Nature Education in the Urban Environment

Proceedings of the 1991 Forum
sponsored by the

Roger Tory Peterson Institute
of Natural History

Central Park Conservancy

Bank Street College of Education

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Introduction

The title *Nature Education in the Urban Environment* may appear to be a contradiction of terms. Mention the word "city" to most people in America and they conjure up a vision of buildings, asphalt, people, and traffic. Yet within New York City alone, there are 40,000 acres of parkland, including Central Park's 843 acres where bird enthusiasts and nature lovers witness the annual migration.

This report is derived from a conference jointly sponsored by Bank Street College of Education, the Central Park Conservancy, and the Roger Tory Peterson Institute of Natural History. Its essential goal is to stimulate dialogue about how to make greater use of existing resources to connect urban children to the natural world. Over eighty leaders representing city schools and nature resources convened for one and a half days in May 1991 at the jewel of New York City's open spaces, Central Park.

This conference report contains perspectives from a variety of informed individuals including our keynote speakers, New York City's Commissioner of Environmental Protection, Albert Appleton, and world renowned naturalist Roger Tory Peterson. Equally important are the views of practicing teachers from the South Bronx to Pasadena, California, and recommendations by the participants who were given the opportunity to engage in a series of facilitated small group discussions.

The reader is urged to use the content of this report as a data source. The perspectives and opinions these professionals offer have relevance for anyone involved in nature education.

Albert Appleton

Keynote Address:
Cities are part of our natural environment

by Albert Appleton, New York City's Commissioner of Environmental Protection

I think that much of what passes for environmental education is not very satisfying. I don't think it's very satisfying to the children, and I'm certain the result is not very satisfying. What arises is often a lot of preaching about being tidy and nice. You know: recycle more, save water more. One of the fine things that can come out of being educated is a sense of craft—a sense that learning is a craft, and ultimately a sense that life is a craft. Life must be learned and continually shaped and re-shaped. As one of the wonderful Jesuit priests who taught me once said, "We who are humans are both artists and artifacts, both maker and made. At the end of a life we look to see whether or not it has a theme, highlights, shape, coherence, whether it is a polished work of art." We who teach—and all of us who try to lead in public life are in some way teachers—must seek to arouse this sense in the people we teach.

Nowhere is this more important than in the realm of the environment, because we are experiencing one of the great historic upheavals in the long history of world civilization. Everyday the world gains 250,000 people. Every day it adds a Staten Island, every week it adds a New York City, every month it adds a third of the United States, every decade it adds a new China. With one out of every five human beings living the middle-class lifestyle of Europeans and North Americans, we have pushed the planet to the edge of irreparable ecological breakdown.

That ecological breakdown can be seen; its historic consequences ripple through more and more. As a race and as a planet, we are headed for a future no one can see. The environment is the history of the 21st century. Those who are to teach urban nature education must therefore teach more than a love of beauty and a love of the marvel of creation. We must teach, in some sense, participation and involvement with the fundamental forces that are the history of this planet.

The future of the world is in cities. Cities are marvelous and wonderful environmental organisms, and they are marvelous and wonderful human organisms. Without cities, there would be no countryside. Organizing the urban experience and making it work is central to the environmental history of the 21st century. One of the first things we must do in urban nature education, I think, is make peace with cities. Our culture teaches people that cities are unattractive, that they are not the norm, that being out alone in the piney woods is the norm. Urban nature education should focus more on cities. It should focus on the question, "What are the right places for human beings to live?" We have got to look at the hidden anti-urban biases in much of nature education and the environmental movement. In fact, city residents use much less energy; it's easier to dispose of their garbage; by and large the water quality around urban areas is actually better, not worse, than in suburban areas. Cities have the density to support sewage treatment facilities. Cities don't pollute ground water.

It is very easy to design a lot of nature into cities. This city has 40,000 acres of parkland and 7,000 acres of natural areas. The largest heron rookery in the state of New York is on Staten Island. Our parks define the city. This would be a much different city without Central Park. What would San Francisco be without its harbor? What would Chicago be without Lake Michigan? Great cities integrate nature into their fabric. We must teach that nature is a part of the city.

We must teach, too, above all, that we are a part of nature. We who are sitting in this room are as much a part of nature as insects and plants. We respond to the same ecological stimuli as other creatures. Our mating rituals are as interesting as those of many animals. Evolution functions the same way in humans. Nature gave us what the mayor likes to call a "gorgeous mosaic." Those of us who have white skin have it because we grew up in an ice age climate. Those who have different skin colors have them for different reasons. All this variety that we can love and interact with exists because of nature. We are the products of the natural environment, and the city is our natural environment—just as the anthill is the natural environment of an ant. If we want people to learn to love insects and to understand snakes, and not to spray against mosquitoes when they build their vacation house next to a wetland, we should start right here by making people see what we are.

With what sort of education do we want to leave our children? We want them to learn not only that nature is beautiful, not only that nature is interesting; but also that there is a right order of things and a wrong order of things in the natural world and the way humans relate to it. Much of what is being done to the natural world is not just stupid and self-destructive; in some larger fundamental sense it is just plain wrong. It offends the right order of things. Children and teenagers and idealistic college students know in their gut that there is a right order of things. If we adults do not steer them toward learning and understanding and being willing to say out loud "this is right, this is wrong," then we will have failed.

One of the things I like most about my job, though, is that people come up and say, "What can I do about the environment?" I hope that adults will not have to ask that question a generation from now. Our work will have been a success when everyone in the cities of the future knows how to answer that question, in cities that are seen as an expression of nature rather than as an antagonist to it.

Roger Tory Peterson

A Discussion with Roger Tory Peterson

The role of nature study in environmental education

For many people, birding has been a first step in developing a love and appreciation for nature. When Roger Tory Peterson published his first field guide in 1934, he began a revolution. In this century no one has been more instrumental in popularizing the field study of nature.

When I lived in Manhattan as an art student, I met various young men from the Bronx County Bird Club. There were eight or nine of them, and they were all teenagers. No two of them had the same regional origin. We had a complete mix—Irish, Scottish, Russian, German, Polish, Jewish, Swedish—and they came from various levels of society, but they all found each other somehow. Most of these young men were passionate people. If someone asks you if they should go into ornithology, it depends on their passion. I am irked by some of those who embrace the environmental ethic but can scarcely identify a dozen birds, or even fewer plants or other animals. Instant environmentalists, I call them. How can they call themselves environmentalists if they don't know the components? To build a house you must have the materials. Awareness of the environment and of conservation comes from feelings, things, and concepts. Feelings usually come first. Then the names of things—birds, animals, and plants. Then a knowledge of what they do and how they interact, and finally the concepts.

Birds are the most beautiful, most dynamic, most observable of all wild things. They have been the focus of my life since I was a boy of eleven. But what, you may wonder, happened when I was eleven that changed me from a difficult youngster to an intense birdwatcher? It was because of a seventh grade teacher. Think of the dilemma of being a teacher. How do teachers know whether their efforts are successful? How do they know whether they have really gotten through to their students? It may take years to assess this; a teacher may never know.

To use my own history as an example: I would not be speaking here today were it not for Blanche Hornbeck, my seventh grade teacher in Jamestown, New York. Miss Hornbeck organized a Junior Audubon Club. For a dime we each got a membership, and she gave each of us ten leaflets about birds, each with an outline drawing on the cover. Coloring in the outlines was not much of an artistic challenge. So Miss Hornbeck also provided us with watercolors. She had us copy some of Louis Agassiz Fuertes's color plates from *Birds of New York*.

Although the Blue Jay I copied was my first attempt at bird drawing, the incident that really hooked me on birds for life took place the following weekend. It was a Saturday morning in April of 1920. It was April 8, to be exact. Carl Hammerstrom, who lived up the street, and I were free of school that day. We crossed the tracks and climbed Swede Hill to explore new territory. As we entered a grove of trees near the old reservoir, we spotted a bundle of brown feathers clinging to the trunk of a tree. It was a flicker, asleep, with its bill tucked under the feathers of its back. It was probably resting from migration. We thought it was dead. I touched it on the back, and instantly this inert bundle of feathers sprang to life, looked at me with wild eyes, and flashed away on bright golden wings. It was like a resurrection. What had seemed a dead thing was very much alive. Ever since then birds have seemed to me to be the most vivid expression of life.

Butterflies fly too. They're elegant and vibrant, but they don't sing. And flowers, lovely as they may be, are rooted to the earth. To me, as a youngster,

chafing under the regimentation of the classroom and the demands of a stern father, birds seemed to have it all. They are attractive, they sound off with spirit, and they can fly wherever they choose, whenever they choose. I'm sure that is what appealed to me when I was a boy. There were times when I wished I could fly as they did and get away. Ever since that day in April over 70 years ago, birds have occupied my daily thoughts, filled my dreams, dominated my reading. Too narrow a focus? Not really. Watching birds has sharpened my senses, made my hearing far more acute, my eyes more perceptive, my reactions quicker. This awareness has radiated far beyond the birds, embracing nearly everything that is alive, from my fellow humans to the least beetle or cricket.

I can remember every field trip that I made during those first few years; I could recall almost every bird I saw, and the date. Then it became, as it does with so many boys and some girls, a competitive game to see how many birds I could identify in a day, to discover rare birds. Gradually I became interested in the way birds live. As I learned more about them, I found that they are not quite the free creatures I had imagined them to be. They are bound by all sorts of natural laws. They go north and south almost by the calendar. They seem to follow certain flyways. A bird that lives in Vermont will not think of going to Wisconsin next year. With their high rate of metabolism and furious pace of living, birds demonstrate perhaps more clearly than most other animals the forces of life. They are indicators, quickly reflecting changes in the environment—the environment we all share. They are an ecological litmus test, an early warning system sending out signals when things are out of kilter. It's inevitable that the intelligent person who watches birds or mammals or fish or butterflies or plants becomes an environmentalist.

In the old days, birdwatchers were stereotyped. Two or three of my classmates who harbored a secret interest in birds didn't even tell anyone about it until some years later. At school I was kidded a lot, but I didn't let it bother me. I was the non-conformist in school. I really wasn't a good student. I flunked biology because I argued with my teacher. She said the Snowy Egret was extinct, and I said, "No, it's not; it's been coming back since 1925." You don't argue with such a teacher.

But Miss Hornbeck was very different. She indicated that she did not know much about birds; she said, "I'll learn with you." I think this is the important thing; she had a lot of enthusiasm and she made no bones about being one of us. I seem to think like an artist. I don't think like a computer; I don't go by the rules. In other words, I'm not exactly a clone of my teachers. I think that's something to have in mind: sometimes you have a student who you might think at first is not going to make the breakthroughs.

I like to think of my own contribution to the conservation and environmental movement as one of interpreter and opinion maker through my writing and my painting. It started with my field guides—a visual system for putting names with things by employing shape, patterns, and field markings. My field guides are useful and functional, but to do their job, the paintings are rather simplified and schematic. To have done them otherwise would have compromised the purpose for which they were intended. Simplification is a short cut to field identification, so that a person might soon gain some confidence and get on to behavior, ecology, artistic portrayal, environmental activism, and other pursuits.

Urban Nature Education
Four Perspectives

MARITZA MACDONALD *is Director of Pre-service Programs at Bank Street College, New York. In thinking about curriculum development with teachers, she seeks the experience and knowledge that learners bring with them to new learning situations. She has a long standing interest in multicultural education.*

The program I direct is for people who have not taught before, which is wonderful because they come with all the idealism that was born to the profession. We don't have to change a lot of old habits. We don't have to say, "You don't have to do it like that." They are just learning, and they become very involved and passionate.

My concern as a teacher educator is how to approach the relationship between children and adults so that learning can happen. To respond to the needs of the urban child, I have to respond to the fact that the demographics in the city are shifting. The last census says that between 1980 and 1989, New York City absorbed 854,000 immigrants, mostly Asians, Caribbeans, and Latin Americans, and also African-Americans from other cities and towns. I have to make it my business to know who the children in the urban setting are before I can even begin to decide how to help the dialogue between the children and the teachers.

I spend a lot of time in classrooms, because I like to talk to the kids. I like to find out what they are worrying about, too. I find that I really have to look at the curriculum with teachers, to find opportunities to build curriculum that surfaces from the children. That involves finding out what kids bring with them and what they know about, and trying to interpret that.

In thinking about what kids bring with them, there is always the desire to know, "Why did that child say that?" I went into a classroom a few years back, and this kid was terrified of snakes. The teacher said to me, "All of these Latino kids are really scared of snakes. I don't know what to do. I have these wonderful snakes, and everybody loves the snakes except for the Latino kids." I said, "Let's find out why they hate snakes." At the next parent meeting I asked, "What do you know about snakes?" and they said, "Snakes! They have those snakes in the classroom, and they're terrifying!" I asked them to talk about the snakes that they knew. Well, for everybody who was raised in areas where the snakes are extremely poisonous it's an instinctual thing to stay away from them, because if you don't, you're not going to live very long. That doesn't mean that you don't teach about snakes, it means you start from the position that there are poisonous snakes and there are nonpoisonous snakes, and you build from there. Understanding the conflicts in the lives of people helps us understand why some things happen and how we should teach.

Another time, a group of teachers and I talked about ways to teach metamorphosis. Everybody said, "Why don't we do butterflies? I'm real good with butterflies. I know exactly what happens." But the teacher from Chinatown said, "I would like to find something more interesting." I asked what she would like, and she said, "Well, I don't know, something that I understand better than butterflies." So we took silkworms down to the school in Chinatown. Before I even brought out the silkworms, I put some mulberry leaves on the table. The people said, "I know these leaves," and they started talking in Mandarin and Cantonese. They recognized mulberry leaves, and they knew about silkworms, and that started this whole thing about going on tours around Chinatown and finding clothing made of silk. It was a

project that took on a life of its own. You tap the things that they know rather than the things that they don't know.

I also have done a workshop for parents and children at Bank Street College. Several coordinators in District 4 had said to me, "The kids disconnect from their parents. Because their parents don't speak English very well, they are disconnected from their families." So I told them about the workshop, told them I would do it in Spanish, and suggested that they bring some of those families. Because a lot of families that come still have enough connection with agriculture in their countries, we decided to start growing different kinds of beans and corn, and I brought them on the day of the workshop. I brought all kinds of popcorn, and lots of beans. The parents came in and they started talking like crazy, in Spanish. The whole thing started with a familiar experience. What happened in the process was that I had to move back, which was very nice. I had very good books, so that the parents could look at the pictures and talk to the kids. Basically they said, "We know a lot about growing corn, we know a lot about growing beans." And the kids said, "You know something about something?"

I just encouraged the dialogue between kids and grown-ups. I told the parents that they lacked opportunities to talk to their kids about what they know. We started thinking of ways in which they could talk about what they knew to their kids—that was really science, that was really nature. And the kids said, " I didn't know you knew this, I didn't know you knew how to plant, I didn't know..." We talked about the parents' stories, and I wrote down some of their stories for their kids. I said, "Why don't you take these stories home—they're your moms' stories and your dads' stories; see if you can make your own stories." It was amazing. They left with this little plant like it was the biggest treasure they had gotten in a hundred years. It was the connection. We always try to think, "What do people know? How do we tap into what they bring?" and then work from that.

Yesterday I was at a school on the west side that has a large percentage of children of Spanish background, and they were studying land formations. I'm always on this nature kick—I bring nature into everything. The kids had invented the idea of a canoe trip, which was fantastic because they got to write letters to their families: "We're going on a canoe trip and I'll miss you, and this is what I want to take." They had brought in literature and writing and geography. I brought my copy of *The Voyage of the Beagle* and read an entry that Darwin had written on May 9, 1834. They said, "You mean this man was from England, and he was traveling and watching all this stuff?" I said yes, but he was asking the people that were there: what were these things about; what were they observing; why were they different? There was a dialogue. And the kids asked, "Where can we get that book?" The whole idea that 157 years ago someone would try to take a trip around South America! What did he find? We talked about finches and about evolution. But it really had to deal with the question, "How can I make a connection with this person?"

That is one of the biggest issues for me now—to understand urban children and where they come from, and to assume that they bring a lot with them. Find out about those places. I think it's hard to find out about all those places and about what they have, but I think partnerships work between people who have been there and people who are here who know science and geography and want to connect these disciplines. I think that all the support programs that we have in the city are terrific. I have seen people talk about the bird house in the Bronx Zoo to teachers who have just started to look at bird migration with fourth graders who are also studying immigration; they can deal with the concepts of where birds come from and where the children come from. I work in Queens, and in Queens there are lots of new

children from this place and that place. I always ask myself, "What do I teach and how can I make it appropriate?" I believe that we need to develop a global perspective toward nature studies. It's everybody's business and everybody's responsibility.

ELIZABETH REEVES-FORTNEY *is a consultant on environmental design for play areas for children with special needs. As a teacher and curriculum developer at Pacific Oaks College's Children's School in Pasadena, CA, she helped develop the early childhood nature education program that is co-sponsored by Pacific Oaks and the Roger Tory Peterson Institute.*

I've been fortunate to be a part of the combined efforts of RTPI and Pacific Oaks College in creating a nature education guidebook for preschool teachers. We hope that it will be unique and address the issue of age-appropriate activities, which link nature education with the classroom, the child's home, and field trip opportunities. We have been exploring the relationship between nature education and developmentally appropriate early childhood curriculum. I would like to address that relationship and give some examples of activities that we have developed.

Developmentally appropriate education refers to subjects and methods of teaching that are based on the current knowledge of child development and learning. It incorporates a wide variety of instructional strategies, materials, equipment, and learning experiences to respond to children's individual differences. Such differences include maturation rate, learning style, attitudes about learning, skills, and knowledge.

Children find satisfaction learning through self-initiated activities. A curriculum should respond to children's own interests and their need to feel that they are a valuable part of the learning process. This kind of curriculum is sometimes referred to as emergent curriculum. In young children, thinking is linked to action. Children are curious; they are explorative; they learn through construction and creative

manipulation of the environment; they need direct experience; and they need to explore and experiment.

Learning proceeds with young children from the familiar to the unfamiliar. There is no one body of knowledge a group of children is going to possess when they come to an experience. They all will bring different past experiences, different individual interests, and it's important that a curriculum not be rigid in its scope or sequence, but that it help children connect new experiences to what they already know.

Children learn in an integrated fashion, so a curriculum should not be divided into subject matter distinctions. An integrated curriculum helps children make connections between different disciplines and subject matters. Children learn about concepts such as colors, patterning, counting, and cause and effect relationships within the context of a meaningful theme or experience.

Also, children need to feel safe and secure, so a curriculum should respect children's psychological as well as physical safety. Activities should be planned so as to avoid fear or confusion, with appropriate expectations for skill and mastery, which can generate stress if they are inappropriate.

Children's feelings about themselves affect their thinking. Learning is closely linked to the development of a child's positive self-image. It is important for children to feel that they are competent learners, that they can discover and learn for themselves. It is also important for a curriculum to reflect, respect, and support individual and cultural diversity, and provide relationships that link experiences with the child's home and family experience.

Based on these characteristics of children's learning, we approach the challenge of nature education by focusing on four important areas of the curriculum:

1. Physical environment, both indoor and outdoor.
2. Materials to support and enrich the emergent curriculum.
3. Activities that link nature with children's daily lives.
4. Nature education opportunities in the community and field.

Physical environment

It is important that the physical environment offers a pervasive element of nature education, which children are allowed to actively manipulate and experiment with on a daily basis. At Pacific Oaks we provide a variety of plant and animal life as a part of the indoor and outdoor classroom environment in order to stimulate children's interest in the natural world.

Children can take part in daily activities, in feeding, watering, and tending to various plants and animals. It is also important to have this environment respond to different learning styles. There must be different ways of supporting the experience of exploring. Some children want to explore with their whole bodies in active movement; some enjoy quiet or independent exploration. Some children will process auditory information very well; some will process visual information very well. Also, some children may have physical disabilities which may require environments to be adaptable and accessible for their varying abilities.

In the outdoor environment we promote active exploration, such as climbing on boulders and logs, turning over rocks, and going through bushes. We provide a small area of plantings. Our raised-bed container garden allows children to pick different vegetables, flowers, and leaves and incorporate them into nearby activities such as dramatic play, art, and sand play. Many habitats can be provided for a variety of animal life, such as birds, butterflies, and other insects. At Pacific Oaks, we are trying to turn a section of our outdoor space into a child-scale planting,

which allows children to hide, crawl around, and create a very intimate space within the natural environment for quiet observation. Raised-bed gardens and pathways are designed to be accessible to children with different physical abilities.

Materials

Materials in the classroom and in the field that teachers and children can use to expand upon emergent interests are important for supporting the integrated curriculum. They include magnifying lenses and boxes, temporary observation trays, tweezers, binoculars, a microscope (on request), and paper for recording information.

Activities

A variety of subject areas become embedded in nature activities that emerge from the environment. Children's explorations may lead to experience with counting, classifying, observing patterns, and engaging in representational thinking, as they write or draw about their observations. They can witness cause-and-effect relationships with examples of natural systems in the environment, such as creating compost for garden beds.

Nature experiences can be linked to children's daily lives through activities that reflect the daily use and importance of natural elements. We can look at the plants or other natural items that support a family's cultural or religious observances. We can extend school activities into the home environment through take-home projects, along with information that relates them to ongoing activities at the school. Plant materials can be used in a variety of constructive projects—art activities, clay work, sand play, collage; they can get it right out of their environment. Potted plants and flowers can be placed in the classroom, and children can move them around to create their own sense of environment. I actually brought some plants in and set them on the counter, thinking they were a display; and before I knew it, boom! The plants were placed all over the dramatic play area, and the kids had created a very useful arrangement for themselves.

Natural materials can be used for cooking and for display in various celebrations such as the Chinese New Year, Iranian New Year, Japanese New Year, etc. If you are planting vegetables and herbs, you can reflect the diverse food preferences of families in the school. Small scale take-home projects can reflect larger activities in the classroom environment—a mini-terrarium, for example, is a reflection of a larger one that is an ongoing element in the classroom. When we plant vegetables at school, we send some potted vegetables home with the kids. Pets can go home. We send home insects to be released in their own neighborhoods. Written information regarding these classroom events, with care and handling procedures, go along with the children. Family and community members can become a part of classroom activities, sharing their knowledge and interests. Parents are informed of other activities in the community that support the interests children have in nature.

Community and field experiences

Children are safe and secure in the classroom. Their horizons can be expanded with field trips, which can offer an important sense of independence and confidence for children, if age-appropriate expectations for the children's activity levels and individual interests are considered.

Age-appropriate issues to keep in mind are that children need to feel safe and secure; they must have their physical needs met. I've asked at many field trip sites,

"Where are the bathrooms?" and, "Where can we have a snack?" If the children aren't feeling physically comfortable, their ability to maintain focus is certainly reduced.

It is also important for field trips to have a fluid agenda, which allows children to explore in individual ways according to their interests. Some children may be concerned with safety and stay close to the teacher, some may investigate very actively, and some may just want to tune in to fine details. Encourage children to use all their senses. Offer choices. When we go on hikes, for example, I say to the children, "There's going to be a short hike group and a long hike group. What is your preference?" The short hike group can have very intimate, "home base" experiences, going on short excursions, coming back to reference materials, making plant rubbings and doing different things. The other group is off with their backpacks to hike and have a picnic. As children come back to the same area over a period of time, they gain familiarity, and your expectations for complexity and focus can expand.

Preparation activities can offer children reassurance and help them develop a focus on the trip. We have done things like bring in plant samples or show slides before taking the children on a trip, in order to help them tune in to details, to focus on finding certain things, or prepare them for a sequence of events.

If you took children on a long hike through a Japanese garden, the preparation would help them to realize that indeed the walk was going to end, and they would be excited about looking for elements they had seen ahead of time. Individual interests that come up in an emergent way on a field trip can be expanded upon or reconstructed later in the classroom to keep the experience going. We have done

things like having children construct miniature Japanese gardens that they can take home and share, so they can keep thinking about the experience they have had. Children can draw or write about an experience and incorporate it into the curriculum for quite a long time.

These are a few examples of how we have incorporated nature activities into a developmentally appropriate curriculum. The goal of this is to create independent learners who have confidence in their own learning process and an intimate relationship with the natural environment.

RITA de BRITO *is a teacher and staff developer with the New York City Public Schools. In various capacities, as a Master Teacher and Project Director of a bilingual program in mathematics and science, she has supported teachers as they first adopted hands-on learning projects in their teaching.*

Children are naturally curious about their surroundings. Just watch a baby discover wheels; just look at a seven-year old's eyes when he sees a seed sprouting. So why teach nature education? Nature education fosters the development of an inquiring mind. The subject matter gives rise to curiosity and wonder, resourcefulness and creativity. Students engaged in nature study are able to pose questions, develop hypotheses, and investigate those hypotheses through experimentation. Observing, exploring, ordering observations, and interpreting information are all involved in the study of nature. Communication skills, the appreciation of patterns and relationships, and aesthetic awareness are developed—all fundamental if our kids are to become lifelong learners.

Nature education has been a solution to my problems in the classroom. Through nature education I have been able to motivate my students. I have been able to integrate the curriculum and to engage my students in meaningful work.

I once had a science resource room in a public school in the heart of the South Bronx. We had a very large Hispanic population. The children were always being drilled in reading. A nine-year old Nicaraguan boy named Oscar came into the resource room grumbling, "I hate reading. I hate reading, Miss de Brito. Where's the book on frogs?"

Nature education plays a very important role not only in our classrooms, but in our lives. One long look at the night sky puts our lives in perspective—psychologically, physically, and spiritually. Our children will be the caretakers of our earth, our biosphere, which is in chaos. We're suffering from pollution, from floods, from war, from famine—a sad legacy to leave our children. They must take responsibility for the conservation of our planet. That's a very important reason for teaching nature education.

To deny that we have a special place in the world might seem like modesty in the eyes of eternity. It might also be used as an excuse for evading our responsibilities. The fact that no species has ever had such wholesale control over everything as we have now, lays upon us awesome responsibility. "In our hands now lies not only our own future, but that of all the other living creatures with whom we share the earth," to quote from David Attenborough.

We need to understand how nature works, if only for our immediate benefit. Each school must develop a policy for teaching science. Teachers need to discuss what is meant by teaching science, and they have to agree on the body of knowledge, the experiences, the attitudes, the skills, the concepts that students will acquire while engaged in science education. There must be ongoing discussion about the

reasons for carrying out science and nature education with children in the age range appropriate to their schools.

An integrated curriculum and cooperative learning models are widely looked upon as viable teaching methods for the child who is easily distracted as well as for the child who is acquiring a second language. Making our students responsible for their own education means paying attention to what interests them. I have yet to meet a kid who isn't interested in ants and whales and plants and all of those things that sometimes make adults recoil.

Teachers need ongoing support when attempting to include nature education in their classrooms. They need to understand the relevance of what children want to learn. They need to understand the value of looking and wondering. They need to understand the value of imagination and creativity. These are all characteristics which we know serve us well.

Teachers need time. They need time for joint planning. They need time to have experiences with the natural world themselves. They need to be considered learners. They need to have a shared purpose. They need to have a say in what gets taught and how it gets taught. They need to be confident, and trust in themselves as educators. They need consistent, relevant training from knowledgeable people to become familiar with the technology and the terminology of nature education. They need to ask more open-ended questions and to consider what it takes to get ahead with nature education, so that they can do something about it.

I leave you with a quote by John Burroughs: "The most precious things of life are near at hand, without money and without price. Each of you has the whole wealth of the universe at your very door. All that I have may be yours by stretching forth your hand and taking it."

TALBERT SPENCE *was the Director of Pre-College Science Programs at the New York Academy of Sciences at the time of this conference. He is now Chairman of the Department of Education at the American Museum of Natural History in New York.*

I would like to give you a little historical perspective of where nature education got started, at least in this country. I'll give you my own first experience. And then I'll lead into some of the earlier ones.

My first experience was in the backyard of a very small strip of land that my grandmother owned. Her father was a farmer, her grandfather was a farmer, but she was more interested in being a carpenter. However, she wasn't able to do that because back then women weren't carpenters. But, she brought with her these experiences when she left a rural environment and moved into cities, where she lived until her 84th year. She brought with her things that she learned as a child, from family and friends on the farm. So my grandmother told me, a willing laborer, to go out and turn the soil. I said, "What does that mean?" She gave me a hoe and several other tools, and she said, "Here's a strip. I want it turned over. I want it ready to plant." So I began to do that. This was in Philadelphia, in an urban area of row houses. I would rather have been playing basketball or other things, but she was the ruler of the house. She fed me, she clothed me, and I had some basic responsibilities. I was going through a nature study experience without getting all the words and jargon caught up in it. I was there with a lady who told me things about her youth. I was there with a lady who showed me why certain things happen. I saw bugs and worms and I said, "Well, those are important." I wasn't going around smashing everything.

I was different from a lot of my friends, who had other interests. There were times when I had to steal away, to explore or go to museums. Because my family couldn't take me to museums, I found another way of doing that, through the Boys Club across town.

But that first experience of working in her backyard each spring and summer—cutting flowers, planting, and harvesting corn and squash—was very important. There was nothing like that happening in the Philadelphia public schools, nothing connecting me to the land or asking me where I came from, what kind of value systems I had, what kind of resources I had.

Having that experience has pushed me into this field, which I enjoy. We know that education about the environment is key to our world's survival. Our nation has serious environmental problems, and we need the collective energy and creativity of young minds working on them constantly. Public understanding of how natural systems work will greatly accelerate the process of enlightening our youth and their families. How we see and explain the world and convey this knowledge to future generations determines the organic growth and development of our society.

In preparing our youth for the environmental challenges of today and the 21st century, we have to see the significance of nature education and nature study in the historical fabric of this country. As early as 1891, Wilbur Jackman's book, *Nature Study for the Common School,* launched the nature study movement. The leaders of this movement placed a high value on using the outdoors as a laboratory to discover and explore an individual environment with an integrated, academic approach. One national organization, the American Nature Study Society, which was established in 1908, helped to nurture this young movement with the belief that nature study should not be unrelated to the child's life and circumstances. Moving forward into the 1920s, L.B. Sharp and Julian Smith, leaders of the outdoor education movement, forged an appreciation of the multiplicity of factors that classrooms tend to isolate. For example, Sharp and Smith believed that dissection of a frog and the study of

earth science with soils in a laboratory have a very limited relationship to the context in which such things occur. Outdoors, they felt, it was impossible not to see this context, and specifically, to see the interrelationships of frogs and soil. Nature study and outdoor education foster learning in an integrated way from an integrated environment.

In the 1930s, the conservation education movement emerged with a primary objective: to educate the public to environmental problems and the value of preserving natural resources. The focus of this movement was on problems which themselves were products of many interrelated factors. Programs under this framework provided students opportunities to explore systems through a more integrated learning process. This approach to learning ran counter to the prevailing waves of academic theories from universities and colleges about how students should be taught, and how teachers were prepared.

In the 1960s, Rachel Carson said, "I truly believe that we in this generation must come to terms with nature." And I think we are challenged, as a society never has been challenged before, to prove our maturity and mastery, not of nature but of ourselves.

In the 1970s, during a period of awakening and awareness of global environmental issues, two organizations were born that have taken on major leadership roles: the North American Association for Environmental Education in 1971, and the Alliance for Environmental Education in 1972. Collectively they represent about 50 million people. NAAEE is an organization of educators, museum and nature center professionals, and scientists. The Alliance, on the other hand, is a membership organization of organizations, with over 150 members, including environmental education, business, labor, health, civic, professional, and public interest groups. We feel that is important for these kinds of synergies to come together, so that the public can communicate.

Moving on to the 1980s—the information age—the Alliance for Environmental Education was very involved in establishing a national network for environmental education. This is a system of centers that assess needs, provide services and teacher training, program development, community outreach, and research and evaluation. There are lots of programs out there. Many of them haven't been evaluated properly, and many of them shouldn't be happening. But there is a mechanism nationally for this type of communication.

Major objectives of this national network are to reach a broader community of environmental education organizations and to create a broader constituency for environmental education. Again, I'm using environmental education as an umbrella—that's where we have run into problems with definition. Nature study is a component of this whole process, and only one of the many things that should be happening. We need an efficient mechanism for sharing resources and ideas to promote public and private partnerships, to promote collaborations between environmental organizations, and to foster communication, cooperation, and exchange on the local, state, regional, national, and international levels.

In 1988, the Congressional Office of Technology Assessment published the results of a study. Titled *Educating Scientists and Engineers: Grade School to Grad School*, it suggested several national goals that I think are appropriate to what we are dealing with here. It suggested that the national goal of maintaining and invigorating a productive science and engineering work force demands efforts on three parts. First, capable young people must be sought out and welcomed throughout the school years. Second, their individual talents must be nurtured by elementary and secondary schools and institutes of higher education. Third, they must perceive that

there will be fulfilling jobs available to them when they graduate.

My experiences at Wave Hill‡ give you examples of what I tried to do during my ten years there. I began by reading a book by Helen Ross Russell, who has been a friend for the last seventeen years. In her book *Ten Minute Field Trips*, one of the things she focused on is the urban environment and how to use the resources around the school site to engage students in discovery. At Wave Hill, the natural environment has lots of wonderful features, but it is isolated from the norm of where our children are coming from. Many of our students have worked with Rita de Brito in the South Bronx, in neighborhoods that they looked upon as negative. I felt that our mission was to go into those neighborhoods, to go into those schools and provide teachers with tools that could help them look at the resources in their own backyards, and then build from those experiences.

Coming to Wave Hill or to Central Park can be a very isolating experience. Teachers came, had a good time, and then went back. What we tried to do was build a process into their staff development in which we showed them how to use the resources around them. The experiences that the children went through were the same type of experiences that we put teachers through. We tried to get over the phobias that were discussed earlier about science, about language, about investigation. We tried to empower teachers to explore the skills they already had, to deal with the assets that a teacher can bring to the enterprise. Likewise, we looked at

‡ Wave Hill Center for Environmental Studies, in the Riverdale section of the Bronx, offers workshops for teachers and an environmental education program for classes of school children, grades K-8. Wave Hill uses its magnificent gardens, wooded hillside, and historic residential buildings to apply its programs (Hudson River Studies, Indoor Gardening, and *Descubre*), which enable children to discover nature in their own neighborhoods.

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assets that the children brought. From there, we began this process of learning together. We modeled a way of doing things, getting away from leading and following, and focusing on facilitation, task-oriented learning, and having students develop their language. They come to the scientific terms as they seem to be appropriate. If a teacher says, "I don't know, let's figure it out," learning is stimulated and can be most exciting.

To validate that idea, Dr. Eleanor Duckworth in her book *Having Wonderful Ideas and Other Essays on Teaching and Learning*, said the development of intelligence is a matter of having wonderful ideas. In other words, it is a creative affair. When children are allowed to be intellectually creative and when their ideas are accepted, then not only do they learn about the world, but their general intellectual ability is stimulated as well.

Finally, environmental education and nature study provide a compelling rationale for broad, integrated education. Nature study should be understood as an interdisciplinary process rather than as a discipline in itself. It doesn't compete with or replace biology, economics, or political sciences. It embraces those things. It is a guide to bringing these and appropriate disciplines together on environmental problems. Nature study and environmental education act like an umbrella.

I want to leave you with a quote from Aldo Leopold. In 1945 he asked, "When are we going to realize that land is a community to which we belong, rather than treating it as a commodity that we can exploit?"

Nature Education Resources in the City

Teachers representing four environmental education programs addressed the conference and asked these questions: What makes a nature studies program successful from the point of view of the client? What are the impediments to nature studies in the schools? What follows are four contrasting approaches to programming, representing differing approaches to nature studies for children and differing concepts about what teachers need to introduce nature studies to their classes.

TIORATI WORKSHOP FOR ENVIRONMENTAL LEARNING

Nature study in the classroom requires careful teacher preparation and support. In the program for schools of the Tiorati Workshop for Environmental Learning, a partnership of Bank Street College and Palisades Interstate Park Commission, the nature center experience promotes the professional development of teachers. Tiorati operates on the principle that the teacher is the leader when his or her class visits the nature center. When teachers and Tiorati educators meet to plan a class experience, they consider the ongoing curriculum in a class and tailor the program for each class in accordance with that.

DELIA SUSARET is a fifth and sixth grade teacher at River East School in Manhattan, New York. She has participated in the Program for Schools of the Tiorati Workshop since 1983.

I work at River East Elementary School, which is a teacher collaborative school in East Harlem. We're part of the Central Park East complex of schools. Each year we try to get a core curriculum that we use for pre-K through the fifth and sixth grade classes. I say that we touch the kids. Our purpose at River East is to give kids ownership of what they're doing. It's not learning out of a book. Yes, we go to books, we use them for resources. Our resource at River East is the kids' energy.

I will focus in on a project we did several years ago. It was a student exchange with Bennington, VT. Our New York City kids, most of whom are from East Harlem, looked at and rediscovered their own environment and then shared that with kids in Bennington.

We used public transportation to look at Orchard Beach, to look at Gateway National Complex, to look at the woodlands, to look at the rocky coast as close as we could get—using city buses to do this. We went to Inwood Park to look at the marshes.

In the exchange with Bennington my kids found out more about their own environment than they had ever known before. The kids from Bennington were amazed, too, because they were thinking (ominously) "ooh, New York City... ." Parents came with Bennington kids, who were enchanted with my kids and with our environment.

When we went to Bennington, we found out about their backyards, about their routes to school and, again, our kids were enchanted. There are still letters going back and forth between these kids.

Besides the time constraints for the planning, our biggest hurdle to overcome was finances. We had to do a lot of fundraising. And we had to allow flexibility within the day's schedule so that my kids could deal with car washes and cake sales and all kinds of things to raise money to pay for buses to go to Bennington. And it worked.

I never had discipline problems from any of my kids, and in every class we had all ability levels. Everybody helped each other, everybody discovered. We had parent participation. It was a community, and it worked.

Our administration did not represent a hurdle because everybody was supportive. The support from my colleagues was an important resource. "I've got a tank you could use," or "I've got a filter you could use," or "I've got an idea that you could use." And it worked. When I got to Tiorati, the support there was there. "You know, if you try this environment it might not work out so well," I was told. "Let's see if we can try this." I was not denied anything. I got suggestions on how to make it work better. Ideas were there when I was falling apart. And it worked.

Because this was a core curriculum, writing came out of it, science, math, story telling, folk tales, legends that we made up on our own, and productions. Each of the kids became a curator in our mini-museum, which happens every year in my classroom.

It's the culminating activity; it's the final in which each child has a vested interest. If we can keep the interest alive, if we can keep the parents involved, if we can keep funds coming, if we can keep everyone's energy together, I think we can overcome any hurdle. Because the kids are there and ready.

All we have to do is get the kids involved. That's it!

CENTRAL PARK CHALLENGE

Nature study is a risky business for an urban kid. The Central Park Challenge course introduces adolescents to environmental studies through "initiative games." Blindfolded walks, rock climbing, and other challenges fire the spirit of the team. As kids take initiative to surmount obstacles, they exercise and learn to appreciate their own capacity and strength.

ROBERTO VELEZ is Director of the Central Park North End Discovery Program.

A city's children are a great resource. The idea behind the Central Park Challenge is to help those children get to know themselves, to take risks, to cooperate and communicate with each other. An outdoor, experiential education course adapted from Outward Bound, Central Park Challenge also seeks to build a sense of pride and ownership in Central Park, one of New York City's great resources for outdoor education. We have found that by travelling to a setting without the usual distractions and expectations, individuals discover their own potential and can examine the way they interact with others.

Kids are very capable. What they need to learn is how to work together as a community. If we can instill in them a sense of teamwork and compassion for each other, then our job as teachers becomes much easier. In a group there is a sense of security, a sense of trust, and a bond between each person. What we try to do in the Challenge course is to help them form these bonds. Here's an example:

A group of junior high school kids came over to the Central Park Challenge, and with them was a young man named Preston. Preston has some motor difficulties, and can't really do a lot of things that the other guys can do.

We went ahead and did an exercise that teaches trust, and things were going well until we got to a rock climbing challenge. We began to scamper up, and all the guys made it except Preston. There was Preston at the bottom and he began to climb. He fell. He got back up, and he climbed again, and

he fell. All the guys got together and said, "Hey, man, suppose we support him and push him up and get him over this thing?" I said, "I don't know. Why don't you ask Preston?"

Preston turned around and said, "Ah, let me try it one more time." He began to climb. This time he got much higher. Near the top he began to slip, and all the other boys reached their hands down and grabbed him to pull him up, but Preston shrugged them off. He said to them, "I'm going to do this on my own, because I can."

They all stepped back and watched as this young man, with tears in his eyes, forced himself up and finally reached the top. He yelled out, "I made it!" We all cried. That is what it's all about, people. When kids get the idea that there is nothing that they can't do, that there is no challenge that they cannot overcome, we've come a long way toward educating them.

BROOKLYN CENTER FOR THE URBAN ENVIRONMENT

Studies of the urban environment can reveal delicate intricacies of the natural world and the wonderful stories of people to city children, giving them reason to care. The Brooklyn Center for the Urban Environment explores Brooklyn's natural and built environments. Programs at outdoor study sites involve hands-on learning to develop observation skills and environmental sensitivity.

EILEEN R. BLANK is an Early Childhood Science Specialist at the Brooklyn Center for the Urban Environment.

The Brooklyn Center for the Urban Environment, or BCUE, was known as the Prospect Park Environmental Center from its beginning in 1978 until the summer of 1990. Its name was changed to more accurately describe its mission: to educate the public about Brooklyn's urban surroundings, its natural spaces, and people-made places. Both of these must be incorporated to encourage an understanding and appreciation of the urban environment.

We offer programs for children throughout Brooklyn from neighborhoods as diverse as Red Hook and Bay Ridge. Our students represent the racial and ethnic diversity of the borough. Our programs are multidisciplinary. We incorporate the natural sciences, the arts, social history, and architecture. Both the natural and built environments are used in our programs.

Prospect Park is a 500-acre, designed natural space. It is the setting for many of our programs, but we also branch out into Brooklyn's neighborhoods, using such sites as the [Graham Darby] Plaza and the Brooklyn Bridge for teaching settings. Teachers are informed about the content of our programs through resource packets and suggested pre- and post-trip materials. We hold teacher workshops at the beginning of the school year. Our multi-session programs include planning sessions between BCUE instructors and classroom teachers prior to the beginning of the program and at the midpoint between sessions. These sessions introduce teachers to program content, inform the instructor to particular needs of the group, and most importantly, create a bond between the two members of the teaching team.

BARRY WERNBROM is a junior high school teacher whose involvement in the Brooklyn Center for the Urban Environment has been most expansive. His first contact with BCUE was ten years ago. Today he is developing a program called "Trees and Me," and he is instrumental in coordinating a program at a local junior high school called the Center for Environmental Studies.

It's a pleasure to be here to share with you common thoughts and feelings about education. Ten years ago I became associated with the Prospect Park Environmental Center. There was a lot of learning going on, people were spontaneous, there was excitement. That was an organization that I wanted to associate myself with. I had been teaching fourteen years at the time, and took a sabbatical with them and developed a spin-off of their program on streetscapes, in which kids got a feeling for their environment. As Dr. Appleton said yesterday, the city, the urban environment, is one that is an important part of nature, and understanding that leads to a pride in one's own being and environment.

I helped establish a partnership between our school and Prospect Park Environmental Center, now known as the Brooklyn Center. With the support of the principal, we were able to integrate our seventh grade life science curriculum with the park experience. We went to the park to be exposed to the various ecosystems there. We're fortunate that we are close to that area, but as we learned from Helen Ross Russell, right in your schoolyard there is a whole host of environmental factors to be observed.

This is an exciting program. Our first class is now, three years later, ready to graduate. I hope some will go into environmental studies, and look for high schools that will continue the direction that they are moving in, maybe even someday go into an environmental profession.

The Center for Environmental Studies also incorporates other institutions, such as the Manice Center, where we have had camping experiences, the Brooklyn Botanic Garden, and the aquarium. The idea of classrooms without walls does work, but it takes time, planning, and administrative support. An ideal situation for the Center for Environmental Studies was to have common planning time for teachers of various disciplines, together with the Brooklyn Center, to work out curriculum design and program planning. An example of a program is the water study program, in which a science class looks at the water chemistry and does tests in the ponds. Then we go out to the park, and maybe follow up with a tour of a water treatment plant to see how the city gets its water. The English teacher might engage the kids in reading about water; in social studies the topic might be water conservation.

A program that I put together with my eighth grade students is called "Some More Learning About Recycling." It became a truly integrated program in which kids came out on weekends in sort of community sweeps. For five weekends in a row, we met for two hours and came up with fifteen kids with brooms, and just plowed up those streets cleaning up. The kids sold the recyclable products they found, and shared with the community their thoughts about how important recycling is. We let them be the teachers. It was a great experience. One of the great vehicles to educating kids is to allow them to share what they have learned. I feel proud to be part of this movement, and excited by the fact that the efforts I make today will contribute to a better tomorrow.

NATIONAL AUDUBON SOCIETY / AUDUBON ADVENTURES

Teachers report that they need materials from which to teach. Audubon Adventures, a program of the National Audubon Society, produces a bimonthly packet of ecology and conservation activities and lessons for grades three to six. Topics include endangered species, urban wildlife, marine mammals, and recycling. The materials encourage teachers and students to explore the natural world in their schoolyards.

DONA CANALES spoke to the conference as Urban Environmental Education Specialist from the National Audubon Society.

As Urban Environmental Education specialist, I conduct teacher training workshops, and do some fund raising. Most people ask me, "What do you teach about—birds?" That is a strong association people have with NAS, and it's very important because that is how we originally started—promoting the protection, preservation and respect of birds. But since then we have branched out as a very strong environmental conservation agency. We protect rainforests, wetlands, old growth forests, rivers, oceans, and Alaskan tundra. We were very influential in getting the Clean Air Act implemented. To borrow from Martin Paints, "We ain't just birds." We are a lot of other things.

We are in our seventh year of a program called Audubon Adventures, which involves 15,000 classrooms nationwide. This represents over 450,000 children, and 25 per cent of them are minorities. Again, this is a nationwide project representing cities like Cleveland, Hartford, Bridgeport, Stamford, Newark, Albuquerque, Houston, Los Angeles, and New York City. In New York City alone, we have 705 classrooms; in New York State, about double that. Again, we are really focusing on inner city children and urban situations. We take the demographics of the country and go where the biggest need is.

The Audubon Adventures program consists of lots and lots of free materials. It is supported by corporations and foundations, so everything is free. All teachers have to do is come to the workshop. They get a year's worth of materials. What that includes is a certificate that says they are part of the network. Each kid in the class receives a decal and a membership card, which gives them some club feeling, something that's theirs, and the feeling that they are part of the network. Every two months the teacher gets a reader's guide, and every kid in the class gets a newspaper. We send out packages of 32 newspapers, which we hope is an average number for classrooms. If teachers need more, they let us know. It's ongoing, so that every two months, kids gets something. The topics include things like snakes, pond life, marine mammals, songbirds, deciduous trees, and recycling. We try to incorporate a lot. It's very teacher friendly. Again, it's exciting to get something every two months.

In April we have what is called Audubon month, including Audubon's birthday and Earth Day. It's celebrated with a poster. This year's poster was on the Pacific Ocean, and next year the poster will be on the Atlantic Ocean. I like to see the faces of the kids, how they light up when they start to look at the poster. Every time I look at it I see something I didn't notice before. At the bottom is a diagram that points out the different species.

Other posters have come out before—on tropical rainforests, Alaskan tundra, wetlands, and wildlife—and I have samples of what they look like. It's a lot of fun, it's something they receive once a year, and part of the ongoing program throughout the year.

Because our focus is on the inner city and the urban environment, we develop curriculum that is designed for the urban setting. All the cities, except for New York

(I'm sorry, the funding eventually will be there) get copies of our publication called *Living Lightly in the City*. It's an interesting, hands-on, activity oriented publication. It's very teacher friendly, with activity sheets, handout sheets, and copy-me pages. It's all there. Teachers can do math, science, art, history, and social studies using these materials. But New York does get *A Place to Live*, which is, again, a publication for the urban child. Both publications will be out in Spanish by 1992.

Teachers receive teacher training or development credit, and in some cities they are paid. In New York City we have workshops in all five boroughs twice a year using Gateway, the Science Research Center, the Botanic Gardens, Lehman College, or wherever we are welcome. It's usually something that works well with their programs. I hope I can continue to network with the New York people to spread this information, because I think it's a great opportunity for teachers to have some fun in the classroom. It takes them away from the blackboard and textbooks. A lot of teachers say the program is enjoyable, fun, awakening, and enlightening. Kids get to look at things differently, and gain respect for where they live. They realize it's not the concrete jungle or a dead zone. Even the schoolyard has life that should be respected, and it is connected with who they are.

GATEWAY ENVIRONMENTAL STUDY CENTER

Gateway Environmental Study Center was established during those promising days after the first Earth Day, and it was part of the Park Service's initiative to bring parks to the people. Gateway is a partnership of two agencies. The partnership occurred when creative thinkers in the National Park Service and New York City's Board of Education surmised that the most effective way to bring the urban population to the open spaces of Gateway's 26,000 acres was to establish a working relationship between the Park Service and the teachers and children of New York City.

RUTH EILENBERG was Coordinator of the Gateway Environmental Study Center, New York City Public Schools. She has since retired.

Over the years at Gateway I have seen many, many things happen. Interested teachers responded to the three kinds of programs that were offered: 1) staff development, upon which everything is based; 2) field studies at six different sites; and 3) a program that we originated at Gateway. The camping program was created to overcome an obstacle. Those of you who deal with school buses know that buses may arrive at 10 A.M. or 10:30 (I see some smiles), and have to leave at noon. You've got maybe an hour and a half or two hours to work with those kids. We said, "Wouldn't it be wonderful if we could keep them there for 26 hours, so that we could do star-gazing with them, so that we could study the tides by watching the high tide and the low tide, so that we could see the sunset, and see the sunrise?"

Over a period of time we found that teachers who are willing to camp are something special. Some think it strange that they are willing to spend 26 hours tent camping in Brooklyn. But they are such believers. And they want to share the benefits of what they do with kids—planning, working, and hiking with them. These teachers formed a support group. They called themselves the Camping Leadership Alumni Club (CLAC). They were a support club for the Study Center program, and for the park itself. But over fifteen years, they developed into a highly professional group called Educators for Gateway. They are the second partnership that is so important to what we do.

It boils down to kids and how we reach them. We reach them through the teachers who teach them. We offer them a variety of experiences. Some of them

see the horizon for the first time. Our goal is best expressed by a comment from a group of sixth graders from the Bronx, participating in a residential camping program, Operation Explore. They said, "Thanks to nature for allowing us to come into your home and see the beauty you have to offer."

DAVID COHEN has taught technology at PS 163 Queens, School District 25, the School of Human Ecology and Health Sciences. He is vice president of Educators for Gateway, a volunteer advocacy group for educational programs in Gateway National Recreation Area.

Educators for Gateway began as a group that repaired tents and dug grease pits. Eventually we staffed conferences, wrote curriculum materials, and instructed the camping leadership course. We became a support and advocacy group for bringing other colleagues to outdoor environmental education. We put to rest a lot of negative stereotypes about teachers. If you give us fertile soil, we do indeed bloom and root. The Park Service gave us that soil.

My involvement began in the mid-70s when my principal, who enjoyed taking children to forest parks, said, "How would you like to bring 30 children to Brooklyn to sleep in a tent on the cold ground, make sure they all get fed, they don't freeze, and they come back with most limbs attached to more or less the same place?" And I said, "Yes." Since then I've led more than 400 children and 40 parents to Gateway. The Gateway programs are astounding to me as a New York City teacher. I remain

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an enthusiastic teacher after 25 years because of what I found at Gateway. The recipe for Gateway has eight components:

•Gateway National Recreation Area itself is an incredible natural resource. It doubled the amount of park space available to our children.

•The Gateway program has the vision, close cooperation, and commitment of the Board of Education and the National Park Service to put together such a program. Jean Nazursky, Bernie Kerschenbaum, and Sam Holmes are names that should be mentioned here.

•Gateway offers substantive teacher training. It provides us with both content in environmental education concepts, and specific activities that are immediately useful to us.

•Gateway has quality programs with realistic goals. The tent camping program and the day trips are both wonderful experiences for our children. Operation Explore, which goes to Gateway and results in our spending two nights and three days in the Taconic woodlands of New York State, is a wonderful program. These things happen through the Gateway partnership.

•Gateway respects teachers and what they do. Joseph Fernandez was not the first one to do school based management in New York City. The first and most effective model of that was Ruth Eilenberg's, which is why we're here today.

•Gateway offers opportunities to teach in the most effective ways. This means hands-on, cooperative learning, integrated curriculum, and learning for a purpose, not "chalk and talk." At Gateway we don't ask questions until we find someone with the right answer. Instead we facilitate everyone's finding many right answers.

•Gateway programs relate to children in a context that's different from the classroom. Seeing them in a different light provides insight that may never surface in the conventional classroom setting. You get kids out on a camping trip and you see who they really are. You see how wonderful many of them can be.

•Gateway programs work within a socially responsible context.

No undertaking is beyond improvement, and the Gateway programs certainly have places where they can go.

We need a residential facility at Floyd Bennett Field. There is one at Sandy Hook that's not accessible to the Brooklyn, Queens, Manhattan, and Bronx schools. We need one at Floyd Bennett Field. There are buildings there. We need to run our residential programs through the winter.

We need more interpretive staff to lift some of the load from teachers, and we need more amenities for teachers with the same will, but perhaps not the energy, to go nonstop for 26 hours. The Operation Explore programs have solved their problems, and we would like to see that model adopted at Gateway.

We need more enlightened supervisors. Far too many behave as if they are doing us, as teachers, a favor by allowing us to give up the comfort of our own beds and flush toilets to spend 26 hours with 30 children, no nearby running water, and

portable toilets. The truth is, we do usually return from these trips invigorated, inspired, and grateful to the people who put the programs together. But the truth is also that these trips are a phenomenal amount of work and worry, they cost two nights sleep, the night before the trip and the night of the trip. To have an indifferent or even hostile supervisor is an immense obstacle to doing these programs, and an affront to us as teachers. These trips do so much for the children, for the school, they are wonderful for public relations, and they are something about which the whole school community feels proud.

We also need better outreach to teachers. There are teachers who are very committed to outdoor education. These people have information, but they need to know where the programs are, where the resources are. There are also teachers that might do something with environmental education, if only they knew how. We have to find them and train them.

We also need to work on advocacy. Our programs, our resources are constantly under attack. There was an article in the *Times* about Floyd Bennett Field and the fact that nothing happens there, and no one goes there. The school programs were entirely ignored. There was a letter printed in the *Times*. We responded, and our answer to that letter is in this newspaper. I ask you to read it. The *Times* did print a letter, but not my letter, and not any environmentalist's letter. It printed a letter about "Wouldn't it be nice if Floyd Bennett Field could be used as a commercial airport?"

We're going to come to you for help in protecting these natural resources, and we know that you'll be there.

WENDY PANTOHA has taught science at Public School 251, Brooklyn.

One day a burned out teacher from the South Bronx boarded an old school bus along with 30 children for what she thought would be an overnight camping trip at Gateway. Ten years later that teacher was still there, no longer burned out, happily exploring the many paths she discovered upon passing through that Flatbush Avenue gate. There she found a safe, nurturing environment in which to learn and

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later to teach about the natural world. This rejuvenated teacher learned how to camp, play the guitar, and extend her classroom beyond school walls.

The paths she followed led to the Audubon Society in Connecticut, Pocono Environmental Education Center, Stony Hill Farm, and the Taconic Outdoor Education Center. The insatiable thirst for knowledge that she acquired along the way led to a sabbatical at Brooklyn College filled with geology, biology, physics, and chemistry courses. Her metamorphosis was in progress. This former inner city girl who first stepped on country grass during a Bear Mountain picnic at the age of eighteen now dons hiking boots and a backpack several times a year to lead New York City school children on field trips along city, state, and national park trails. While once she was afraid to enter a science lab, she is now leading hands-on science experiences in the children's lab at Brooklyn Elementary School. Feeling insecure about teaching nature studies, both inside and outside the classroom, was the greatest obstacle she had to overcome.

As this teacher wanders through a wonderful maze, she rejoices in the knowledge that her adventure has only begun, led by such gurus as Ruth Eilenberg, John Kaminsky, and Mickey Cohen. Together with her Educators for Gateway family, this teacher happily explores a new direction in her professional as well as her personal life. And just how does all this influence the urban children in her charge? She got the answer during a recent field trip, when one little girl looked up at her and said, "When I grow up, I want to be a scientist, just like you." Then I knew that I would never be able to mend enough tents, dig enough camp fire pits or give enough workshops to repay my debt to the Gateway Environmental Studies Center.

Recommendations

The forum was organized around the question of how to encourage more positive use of parklands for outdoor nature education. It is a local issue that has national importance. If it can be done in New York, it can be done in Los Angeles, and in other large, urban areas throughout the country. Forum participants were selected because of their recognized leadership in schools, parks, and environmental centers throughout New York City. These practicing professionals engaged in a series of facilitated small group discussions that began with this issue and resulted in the following recommendations.

Improve pre-service teacher preparation with respect to nature education. People in other occupations enter their professions possessing more tools than educators are given. We need to ask teachers' colleges to provide better preparation in science content and the instructional techniques required to teach hands-on nature education. Teachers' colleges should be imbued with a sense that nature education is so important that one can't become a teacher without receiving some type of program that deals with the environment. Teacher trainees need the opportunity to learn how to emphasize nature in other disciplines and to develop a curriculum that is grounded in salient natural world experiences.

Give teachers the opportunity to participate as learners in training and support experiences. Professional development and support must be part of the teacher's regular program. More school administrators need to know that if we really want to inspire our children to save this planet, teachers need resources and time for professional development in these areas. Many teachers report being overwhelmed. Nurture enthusiasm for nature among those teachers who are scared of it. These experiences should tap into the creative process, both on an individual and a group level.

Develop partnerships with community nature resources. Once new teachers are out of college, partnerships with community nature organizations become an essential resource for helping them increase their comfort with the natural world by giving them the materials they need. Teachers have to know about community resources, and they need to become actively engaged with them. The goal of the community resource is to develop educators who become knowledgeable enough to not need them.

Use the immediate environment as a resource. Nature education should begin by using resources at hand. A common problem is that people don't know what others are doing. A guide needs to be provided to every teacher to find and use existing resources. A more effective way for networking is also essential.

Get families involved. We need to work at the community level to get families involved in using parks and other little plots of land as best we can.

Provide every child in New York City with the opportunity to do at least one camping trip. Many participants testified to the disappointment they have heard expressed from both children and adults who say, "I never went camping and always wanted to do it." There was a strong voice advocating at least one overnight campout for every child in New York City.

Recognize cost savings potential of student environmental action projects. Educate the public about the cost benefits to the city of environmental action projects by students and teachers. In a society where dollars count, it makes

sense for students to plant trees and provides an incentive for the city to support such projects.

Establish an Office of Environmental Education and give it a budget. The role of the office should be to oversee the development of effective nature education.

Promote understanding of the goals for nature education by parents, teachers, and administrators. Legitimate concerns for safety and academics are put in a realistic perspective when parents, teachers, and administrators have an appreciation of the importance of nature education.

Improve public relations. Encourage institutions like Bank Street College and the Roger Tory Peterson Institute to get better coverage and ongoing publicity to teachers, professionals, and the public. The whole global warming issue has really surfaced because of a unified public relations effort.

Form a political action committee to organize an ongoing campaign for the public sector and the government, with publicity and advertising. We want to promote environmental education goals to the power structure and to the school districts.

Hold a large conference on environmental education involving a wide cross section of people from the media, industry, education, and the private sector. Involve teachers in the planning of a conference, and be certain that the urban student population is represented. It's extremely important to establish some form of additional networking. One of the key words expressed at the forum was the word "partnership." Greater partnerships result in a fertilization of ideas and actions. This leads to meaningful progress toward reaching the potential of our existing resources for making urban populations more in tune with their natural environment.

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Summary

The nature of environmental education

Albert Appleton, New York City's Commissioner for Environmental Protection, stated early in the conference that we must teach more than a love of beauty and a marvel of creation. We must teach some sense of participation with the fundamental forces that are the history of this planet. Roger Tory Peterson stressed that a child begins this process by first developing an appreciation for nature, and subsequently acquiring ecological concepts by using specific springboards such as birds or plants.

The child as learner of nature

Learning proceeds with young children from the familiar to the unfamiliar. Children bring different past experiences and interests to the process of learning. It is important that the curriculum not be rigid in scope or sequence. Also, the relationship between adults and children greatly influences the child's ability to bond with nature. Particularly important in the multicultural milieu of many urban centers is the recognition that children and their parents are influenced by different myths about the natural world.

In creating nature programs for young children, some elements to keep in mind are the physical environment, materials that support the curriculum, activities that link nature with children's lives, and field experiences.

Teachers are students of nature

To improve the quality and impact of nature education, certain needs of teachers must be addressed: provision for ongoing support, time for planning, and time for natural world experiences of their own. The most effective community nature programs are those that reach into the neighborhoods and provide teachers with the tools that help them use resources in their own backyards.

A view from the field

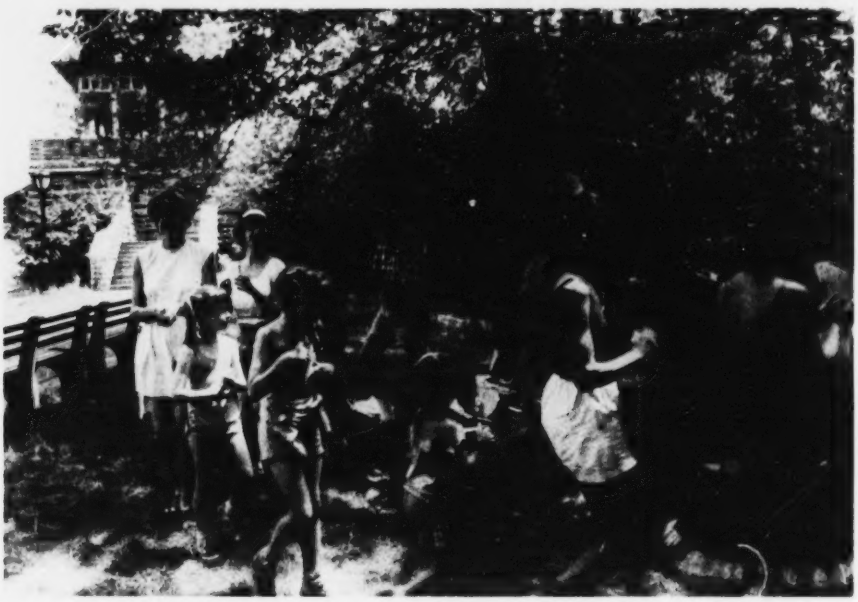
Bank Street College of Education has found that the long term impact of a classroom visit to a nature center is most effective when the classroom teacher becomes the leader. Thus, the role of nature center staff shifts from one of pure nature interpretation to that of staff developer. It has been shown that teachers who develop such leadership skills find them to be directly applicable toward maximizing the use of their neighborhood.

Student involvement, particularly at the secondary level, is essential to successful environmental programming. Ideas such as having students adopt and care for a plot of land, and neighborhood clean-up projects in which recyclables are sold, were two good examples.

Park and environmental center staffs report that it is common to see the personal discovery of nature lead to a sense of self-renewal among both teachers and students. Overnight camping and intensive outdoor challenge programs have proven to be vitalizing experiences. Several teachers testified that such opportunities provided the cure to their own sense of professional "burnout."

Recommendations

The priority items that were distilled from hours of small group discussion emphasize the importance of several areas. Among them are teacher training; school-community partnerships; family involvement; and the importance of camping, outdoor experiences, and individualized curriculum.



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